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Alberta
AGRICULTURE

Volume 1 Number 7 March, 1987

Research Report

ALBERTA
MAR 27 1987

Canola breeder Don Woods says much greater yields are possible

Better breeds mean bigger bucks

Improving Peace River canola

Dr. Don Woods, an Agriculture Canada canola breeder at the Beaverlodge research station, likes to justify his work in dollar figures. "Currently," he says, "the Peace River canola crop is worth $71 million annually. If I can increase the yield by 10%, farmers will earn another $7 million each year. And there's nothing within the species preventing that — the potential is there."

With that goal in mind, Dr. Woods is continuing the pioneering work begun by Agriculture Canada's canola eminence, Dr. Keith Downey in Saskatoon. Utilizing the $375,000 provided this year by Farming For The Future's Research Program, Dr. Woods' work will build on three decades of breeding research. That critical mass of research resulted in canola, a highly refined form of rapeseed, which has become a productive crop competing on international markets with the more established corn and soybean oils.

Originally grown in Alberta as an industrial/marine lubricant during the Second World War, rapeseed was at one time shunned by the agricultural industry, primarily because of its high concentration of erucic acid, a fatty acid nutritionists thought contributed to heart disease. And high concentrations of glucosinolates, sulphur compounds which give foods like mustard, turnip and cabbage their strong tastes, did nothing to bolster its popularity. University of Manitoba researchers set out to reduce erucic acid and glucosinolates to negligible levels and by 1974 they had succeeded. They dubbed the new product canola.

There are now two principal kinds of canola grown in Alberta: Tobin, a Polish variety with a short (95-day) growing season, and Westar, an Argentine variety with a longer season but better yields and higher quality. The latter is used mostly in southern Alberta; the former is used in the Peace River country where there is always the threat of an early frost. Dr. Woods wants to increase Tobin's yield, quality and resistance to disease by "breeding on" those qualities from other sources of canola germplasm.

Improved quality means a higher oil content. Even a 1% change in that factor can mean between $5 and $15 more per tonne to the crusher (Dr. Woods says "there's no reason we can't improve it by 2%"). Better disease resistance will improve yields and save farmers the cost of reseeding. Tobin is susceptible to staghead or white rust, a fungal disease which penetrates the flowers and covers the plant with spores, deforming it and prohibiting it from producing seeds. Another common scourge is brown girdling root rot which affects all varieties of canola but is worse in Tobin. Dr. Woods hopes to increase seedling vigor so the plant grows quicker and thus escapes the disease.

The first part of the "breeding on" process, he says, is easy. Four or five flowers from a budding Tobin plant are opened, their anthers (the pollen-bearing parts) are removed and pollen

(continued on back page)

INSIDE:
A message from the Deputy Minister

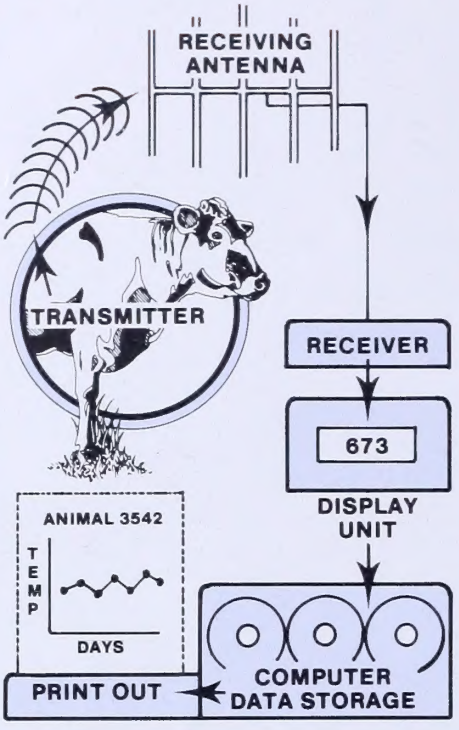
The New Cattle Call

Radio-te call in t

If John Maloney and Pat Harvie have their way, cattle calls may soon be coming in instead of going out. Funded with a $68,536 Farming For The Future Research Program grant, they are developing a computerized radio-telemetry system by which cattle, whether in a feedlot or on the range, keep in constant contact with a central computer. It will allow the producer to identify and monitor the health of each animal in his herd without leaving his office. Predicts Mr. Harvie: "It will be a whole new era in computer farming."

While Alberta has enjoyed a mild winter this year, the death loss of cattle in the province generally runs at 3% — a significant portion of a producer's herd. Stress from transportation or reorientation can be a contributing or predisposing factor in animal disease. In young animals, the resulting losses can be as high as 20%. In cattle, as in humans, early detection of illness facilitates treatment and improves the chances of recovery.

Dr. Maloney, a senior partner of Scicon Biomedical Research, and Mr. Harvie, a senior partner of Biochek Alberta Ltd., plan to use battery-powered transponders, implanted in the animals, to identify them and alert the farmer to possible health problems. "Temperature is the key indicator of animal health," says Dr. Maloney. "If you can tell that the animal has a problem before it drops, there is a chance to treat it."



The transponder is less than a centimetre in diameter and about three centimetres long. Packed in a white biocompatible tube, it is swallowed by the animal and remains in the reticulum, or first stomach, sinking along with the pieces of wire and nails cattle often swallow. It emits a radio signal every five or 12 minutes (it is programmable). The signal is picked up by an antenna, transferred to a receiver and decoded by a computer. "Software," says Dr. Maloney, "is being developed that will graph each animal's hourly temperature." Water and bad weather will not affect that transmitter's performance and it should be good for distances of up to a mile. It can be blocked only by metal buildings. "For that reason" says Dr. Maloney, "it is important that the antenna is positioned properly, preferably on a hill."

"It will be a whole new era in computer farming."

The transponder, which could be mass produced for as little as $15, is designed to last five to 10 years and is recoverable at the packers. It would pay for itself by eliminating the necessity of brands (which devalue a

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Killing with Kindness

Overfeeding your horse is no favor

The last place one might expect to find a victim of fashion is in the horse barn, but Dr. Nadia Cymbaluk, a professional research associate at the University of Saskatchewan in Saskatoon, says current trends in the equine industry lead some animals to tragic ends. "A large, heavy foal has become a show requirement," she says. "People like them big and fat, quite large for their age." To get the desired result (which can often result in a hefty sale price), many owners grossly overfeed their horses. Some might go on to win blue ribbons, says Dr. Cymbaluk, but about 30% will suffer muscular-skeletal deformities, with 10% of those cases serious enough to warrant an early trip to the packers.

Backed by a $73,024 Farming For The Future Research Program grant, Dr. Cymbaluk developed a project to investigate her theory that packing carbohydrate-rich feed into a foal puts an unbearable strain on its growth plates, resulting either directly or indirectly in limb deformities which can cripple an animal. It is an area of study in which there has been little previous work, but Alberta Agriculture horse specialist Robert Coleman says it deserves serious consideration. "I go to lots of Alberta farms where the horses have crooked legs," he says. "Overfeeding is certainly one of the causes. I've seen potentially good horses ruined by it."

Dr. Nadia Cymbaluk and friend

People like them big and fat.

Dr. Cymbaluk and associate professor D.H. Leach compared two groups of nine horses for 18 months (during the six to 24-month stage). Nine horses were fed National Research Council approved rations while the experimental group was allowed to eat as much of the same quality feed as it wished. Comprehensive measurements of weight gain, gait and stride were taken along with a series of stool analyses. Nutrient consumption and digestion efficiency were also monitored. Six horses were postmortemed for positive diagnosis.

The free-feeding group ate 15% to 25% more than the control group and absorbed 15% to 25% more nutrients. At 24 months, the control group weighed an average of 390 kilograms compared to 435 kilograms for the free-feeding group (some owners feed richer diets to their horses, bringing their weights at 24 months as high as 450 kilograms). Six of the nine overfed horses, as

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ng off rustlers (the animals are permanently y identified), and by reducing rates of death urable diseases.

a, receiver and computer hardware would 00. Mr. Harvie estimates the system will be r 1,000 head. A prototype is currently being l tested; a similar system has already been fully with sheep. He expects the identification the system to be ready for marketing in 12 he temperature component following a year result," says Dr. Maloney, "could be a high mpany providing employment in Alberta and aluable service to the livestock industry."

eloped limb abnormalities because their loped too quickly. One of six control-group ostmortemed and found in perfect bio- pe. The five free-choice horses postmortemed *steochondritis dissecans*, a pathological problem l growing bone.

ots of Alberta farms where the ve crooked legs. Overfeeding is y one of the causes. I've seen lly good horses ruined by it."

k also found that the overfed horses had a evel, a problem in that a high degree of crease stress on the limbs. They were also to handle than the other group. The control formly healthy and exhibited no ill temper. ance of the study will be obvious to Alberta , most of whom use their animals for racing, asure. Agriculture Canada has estimated a's total equine population of 321,000, with t number in Alberta. The value of registered West (roughly half are registered) is con- mated at $100 million. If 20% of the total nder two years of age and if 30% of foals in a are affected by growth disorders, as recent e, then the economic losses to the horse xceed $1 million annually.

FARMING FOR THE FUTURE

by Ben McEwen
Deputy Minister
Alberta Agriculture

1987 has already been a pivotal year for Farming For The Future. The program received its new mandate, which extends from 1987 - 1992. Also, in January I appointed Dr. Ralph Christian as Executive Director of the Research Division of Alberta Agriculture. Ralph will oversee Farming For The Future and the proposed Alberta Agricultural Research Institute in addition to his other responsibilities as head of the Research Division.

Many of you know Ralph as the Director of the Animal Health Division. He has a strong background in veterinary science and in agricultural research. He first served the Province of Alberta as a veterinary pathologist in Edmonton. He was subsequently appointed head of the regional veterinary laboratory at Fairview, and later moved to Edmonton as head of veterinary laboratory services. He has proven to be an able administrator, having managed the Animal Health Division, in his most recent capacity, for several years.

His immediate task is to prepare for the imminent implementation of the Alberta Agricultural Research Institute (AARI). You may recall that I introduced the concept of AARI last summer. The Institute will be a research co-ordinating and funding body, maximizing the efforts and, hopefully, the results of researchers in industry, government and the universities. Ralph has a specific responsibility to put together a viable framework within which AARI can function successfully. I know he can do it.

The need for agricultural research is unquestioned. It is, quite simply, the best way we have of ensuring that there will be farming in our future. The immediate goals are:

1. Crop and livestock production research with an emphasis on cost-saving technology that will improve profitability.
2. Marketing and economics research to improve Alberta's competitive ability in world markets, to provide up-to-date economic information and to develop more effective farm business management techniques.
3. Soil and water management research to ensure the continued productivity of Alberta's agricultural resources, to halt the deterioration of farmland, and to reclaim lands already damaged by improper use.
4. Food processing research that will result in new methods, products and uses for both new and traditional agricultural commodities.
5. Special crop research to produce alternative crop varieties suited to Alberta conditions, and to improve production of special crops in order to increase diversification.

On February 18 and 19, the Agricultural Research Council of Alberta (ARCA), which I have the honour of serving as Vice-Chairman, met in Edmonton. At that time we reaffirmed our goals and our vision of the future. We also faced the difficult task of deciding which research proposals would be funded in 1987. Let me assure you that it was not an easy task by any means! We salute the work of the researchers, program committees and all those involved in this process.

We — ARCA, Alberta Agriculture, industry, the universities and Agriculture Canada — look forward to getting on with the work — to carry out the essential research planned and approved for 1987.

Keeping sows off the chow

A computerized feeding system at Bacon Acres

Pigs at the trough, left to themselves, are piggish. The stronger animals bully and trample the weaker ones, a fact that may satisfy Darwinians but one which is unacceptable to farmers. Thus since the early 1960's, many hog producers have been confining sows to individual stalls and feeding them by hand, a system that ensures equitable distribution of food without confrontation. But there are disadvantages. The animals are unable to move freely in stalls; their legs weaken and become prone to injury. Moreover, the cost of building and maintaining compartmentalized barns is relatively high.

"We need to see how it will work under conditions here — in Alberta weather, with Alberta farmers, Alberta feed, Alberta Pigs."

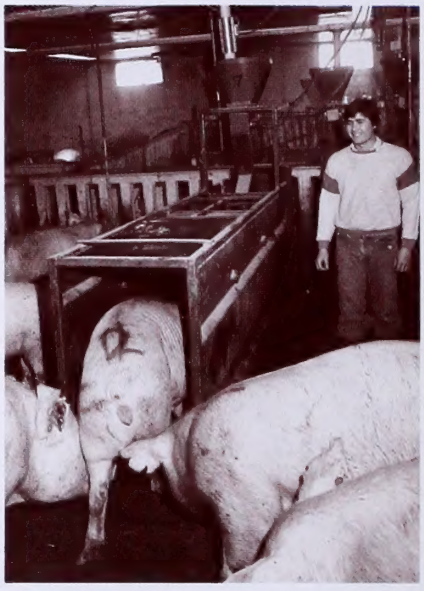
David Allan, president and owner of Bacon Acres at Ranchview Farms, one mile south of Bentley, sought a better way, and he may have found one on a recent tour of sow operations in England and Holland. Producers in those countries, under pressure from animal rights groups to raise their animals in a comfortable environment, have borrowed computerized feeding technology from dairy cow operations with great results. Their herds are strong but docile and easy to breed. While the Europeans liked the system primarily because it appeased the animal rights groups, Mr. Allan saw it as a superior herd management tool.

With a $5,500 grant from Farming For The Future's On-Farm Demonstration Program, he developed a computerized sow feeder at Bacon Acres. His system not only guarantees 240 sows complete daily rations (2.2 to 2.8 kilograms of custom blended pellets of 15% protein, soy-based, with wheat and barley), but also displays each animal's exact daily intake, its identification number, previous litters, size of offspring, number of days between farrowing, and the total feed required through the gestation period. Such a wealth of readily-accessible, up-to-date information allows producers maximum control over their herds.

Under Mr. Allan's system, button-sized transponders giving off individualized signals are attached to the ear of every sow. The sows are kept in pens of 35 and in each pen is a metal feeding crate. The animals are trained to pass through a gate on the crate when they want to eat. A receiver in the crate picks up the signal from the sow's transponder and consults the computer on whether or not she has used her allotment of food that day. If not, she is fed. Because the sows are in pens and not stalls, they are generally healthier and happier. "And there is very little fighting now," says Mr. Allan. "No bully sows destroying the others." (The system is used on sows because it is necessary to control their weight for optimum breeding efficiency. Pigs and piglets are fed all they can eat to get them to market as quickly as possible).

The computerized operation requires only 17 or 18 square feet of space per sow compared to 25 square feet per animal under the stall system. Building costs, including equipment, are $500 per sow compared to $560 in a stall feeder. Manpower requirements are about equal: two men for 240 sows.

Mr. Allan is manufacturing and marketing the system himself. He can set up a 120 sow unit for $60,000. In addition to the 240 sow computer feeder now operating at Bacon Acres, he runs a 350 sow stall barn, a 225 sow stall barn, and he is constructing another 220 sow computer barn. If the computerized operations perform as well as he thinks they will, he will convert the stall barns.



The Bacon Acres system
Borrowed from dairy operations.

Randy Fielder, an Alberta Agriculture regional swine specialist working out of Red Deer, says the computerized system appears reasonable enough but adds that it is still unproven. "The data isn't in yet," he says. "We need to see how it will work under conditions here — in Alberta weather, with Alberta farmers, Alberta feed, Alberta pigs." That notwithstanding, he admits that, "It looks like it has its merits."

Peace River canola . . . continued from page one

from a scrubby, but hardy Mexican variety is applied. The flowers are covered with a bag and left to germinate. Each pod yields 20 to 30 seeds.

From that point forward the research is more complicated and time-consuming. Three generations of the cross are grown in one year in the greenhouse. A year of testing under field conditions follows. Then the best plants are grown in the greenhouse again to provide seed for testing in the subsequent year. The variety is later tested regionally, in Fairview, Sexsmith, Fort Vermilion and Dawson Creek, B.C. If successful, the seeds are entered in Canada Cooperative trials for another three years. The whole process, culminating with registration of the new variety, usually takes 10 years.

And at any time during the research, says Dr. Woods, a drought or a hail storm can ruin a yield trial. "And then you can't tell the best from the worst," he says. "There is no data. It can be heartbreaking." But Dr. Woods, should he suffer such a setback, could no doubt revitalize himself by reviewing the numbers. There are, after all, three million acres of canola grown in Alberta and an increase in yield of 10% would mean a revenue increase of $33 million. "The potential," he says, "is there."

Research Report is published 10 times a year by Alberta Agriculture for Agricultural Producers and Processors.